Creating Mobile Emission Reduction Credits

Presenter:
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Emission Credit Brokers

Emission Reduction Specialists

- To service the Emission Credit needs of our clients, Emission Credit Brokers (ECB) formed a new company called Emission Reduction Specialists. (ERS)
- ERS is completely focused on developing projects that create Mobile Emission Credits.
- ERS has strategic alliances with companies that have technologies, which reduce Mobile Emissions and Emissions from stationary generators.

Mobile Source Emissions

- In most cities, mobile source emissions make up more than half of the total NOx emissions.
- Even thought Mobile Emissions make up the majority of the pollution in a city, it has been prohibitive to abate them due to the high cost of technology.
- SCR/SNCR technology has now made it cost effective to create emissions credits.

Technologies Available for Creating Mobile Emission Credits

- Electric and Fuel-cell Vehicles
- Natural Gas and dual-fueled vehicles
- Catalytic Converters
- SCR/SNCR

SCR/SNCR Technology

- NOx Master by KleenAir Systems
- NOx & PM emission control retrofit system for “mobile source” diesel vehicles and equipment
- SCR/SNCR type retrofit system is based upon the use of ammonia as a reductant being diffused at the exhaust manifold (SNCR).
- This reduces NOx and combines an electronic controlled diffusion system together with a specially formulated Selective Catalytic Reduction (SCR) component.

SCR/SNCR Technology

- The result is a more efficient combination non-catalytic (SNCR) and catalytic (SCR) NOx reduction. This unique aspect widens the reactive temperature range between NOx and ammonia from 250 -1,800º Fahrenheit.
- The NOxMaster System test prototype has demonstrated its effectiveness in reducing the nitrogen oxide contained in exhaust emissions by 70% to 90%.

City of Houston Study

Test Results for NOx Reducing System

Vehicle: Gradall G3WD
Engine: Cummins 6BTA 5.9 Liter Diesel

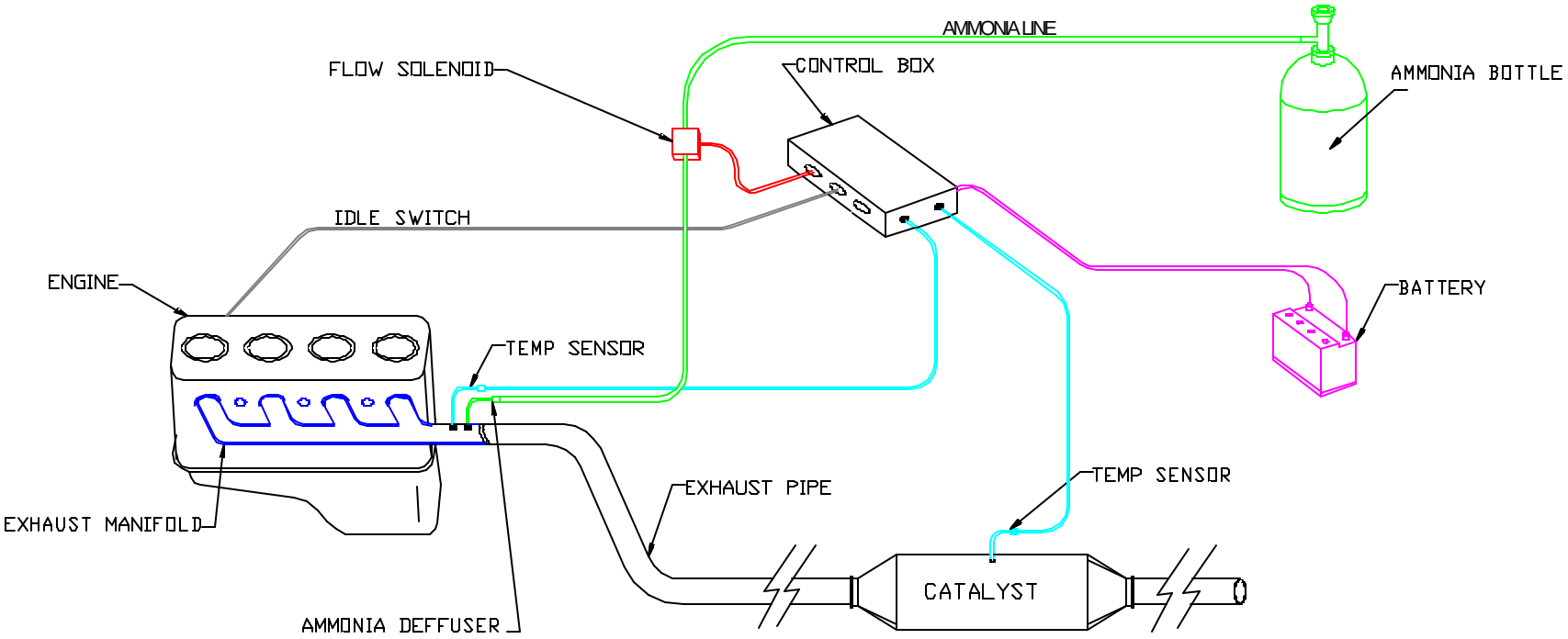
Test Date	Fuel Type	Vehicle Emission Configuration	CO g/min	CO2 g/min	NOx g/min	THC g/min	TPM g/min
Oct 26 2001 - 1	Baseline Diesel	Original	1.02	923	4.96	0.44	0.7
Oct 26 2001 - 2	Baseline Diesel	Original	1.08	919	4.85	0.43	0.693
Oct 26 2001 - 3	Baseline Diesel	Original	1.09	924	4.91	0.43	0.692
Average	**Baseline Diesel**	**Original**	**1.06**	**922**	**4.91**	**0.43**	**0.695**

Test Date	Fuel Type	Vehicle Emission Configuration	CO g/min	CO2 g/min	NOx g/min	THC g/min	TPM g/min
Oct 27 2001 - 1	Baseline Diesel	(SCR/SNCR Only)	0.24	942	1.08	0.16	0.503
Oct 27 2001 - 2	Baseline Diesel	(SCR/SNCR Only)	0.23	936	1.06	0.14	0.536
Oct 27 2001 - 3	Baseline Diesel	(SCR/SNCR Only)	0.27	938	1.07	0.15	0.489
Average	**Baseline Diesel**	**(SCR/SNCR Only)**	**0.25**	**939**	**1.07**	**0.15**	**0.509**
			-76.6	**1.81**	**-78.2**	**-66**	**-26.7**

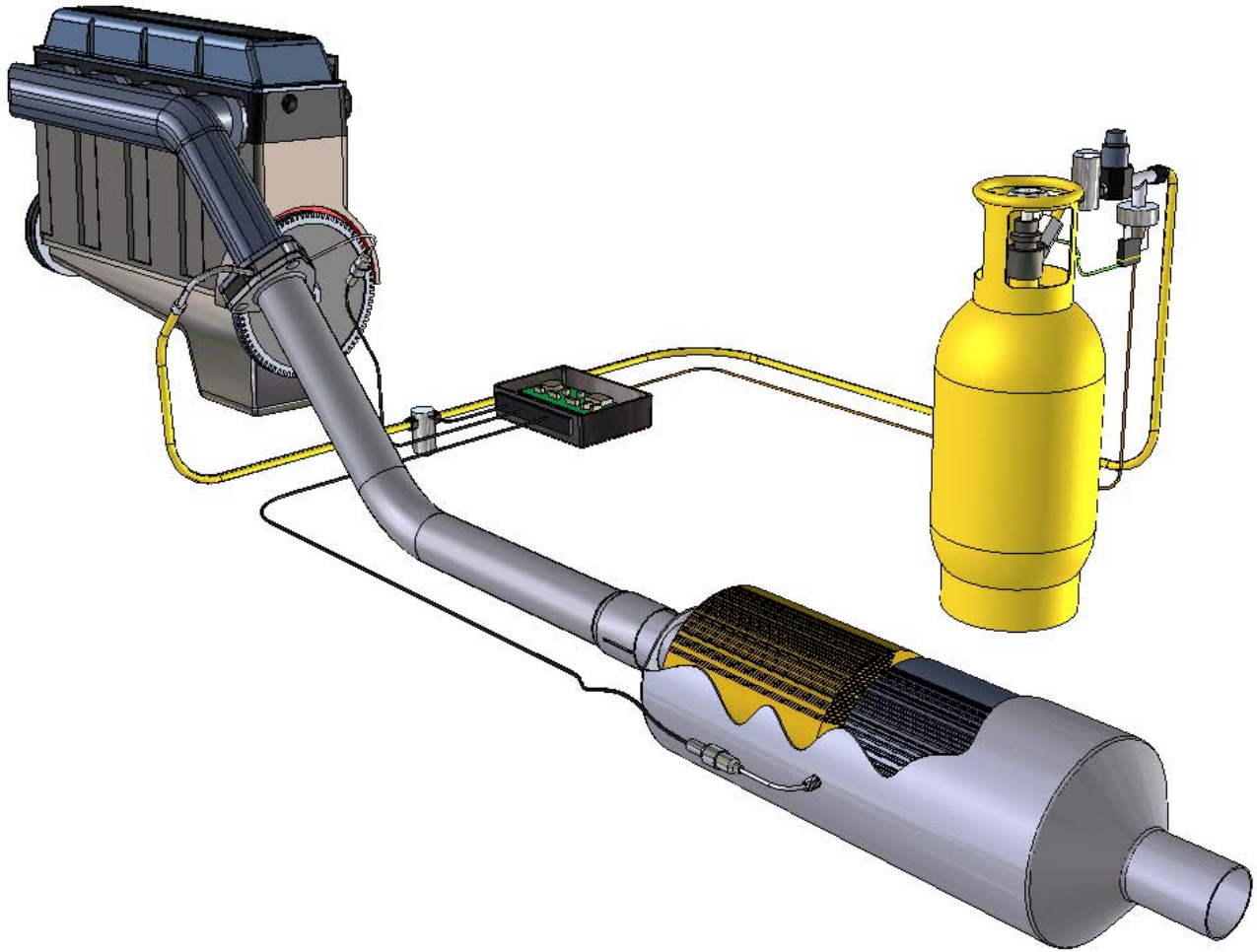
Test Date	Fuel Type	Vehicle Emission Configuration	CO g/min	CO2 g/min	NOx g/min	THC g/min	TPM g/min
Oct 26 2001 - 1	Baseline Diesel	(SCR/SNCR + PM Trap)	0.19	936	0.92	0.08	0.057
Oct 26 2001 - 2	Baseline Diesel	(SCR/SNCR + PM Trap)	0.17	933	0.88	0.06	0.056
Oct 26 2001 - 3	Baseline Diesel	(SCR/SNCR + PM Trap)	0.14	923	0.9	0.05	0.055
Average	**Baseline Diesel**	**(SCR/SNCR + PM Trap)**	**0.17**	**931**	**0.9**	**0.06**	**0.056**
			-84.3	**0.94**	**-81.6**	**-86**	**-91.9**

(value) - Represents Percentage Difference With Respect To Vehicle's Original Configuration

The NOxMaster System



The NOxMaster System



Applications for NOx Master Technology

- Heavy Duty Vehicles (Garbage trucks, dump trucks, cement mixers and 18 wheelers)
- Buses, delivery trucks and construction equipment
- Marine (Tug boats, barges and ferries)
- Stationary Diesel Generators up to 2 MW

Sponsoring Projects that create Mobile Emission Credits

- Identify companies in an area that have large fleets that are not planning to retrofit on their own.
- Run economics of project to ensure that the money spent will yield enough emission credits to justify the cost.
- Negotiate an agreement to pay for the cost of retrofitting the fleet in exchange for the emission credits.

Co-sponsoring Projects

- Opportunity for interested companies to team up with ERS to develop Mobile Source creation projects.
- Split project costs and the credits that are created.
- ERS has $5,000,000 committed for projects in 2003.
- Emission Credit Brokers can sell excess credits from project.
- ERS has a reduced brokerage agreement with Emission Credit Brokers.

Engine Serial Number (Starboard)	8VA 359282	12VAR03129	8VA 13071*	TBD	TBD	TBD
Engine Horsepower Rating (RPM)	253 (1760)	382 (1760)	253 (1760)	253 (1760)	382 (1760)	253 (1760)
Number of engines onboard	2	2	2	2	2	3
Annual Fuel Consumption gals/year ea.	20,181	23,647	14,134	15,869	16,233	22,090
Baseline NOx Emissions g/bhp-hr ea.	36.6	24.6	36.6	36.6	24.6	36.6
Reduced NOx Emissions g/bhp-hr ea.	4.019	4.019	4.019	4.019	4.019	4.019
% Operated in L.A. Harbor	100%	100%	100%	99%	50%	100%
% Operated in SC Basin 1 = 100%	1	1	1	1	1	1
Energy Consumption Factor hp-hr/gal	14.43	14.43	14.43	14.43	14.43	14.43
Estimated NOx Reduction tons/year	**10.45**	**7.73**	**7.32**	**8.22**	**5.31**	**11.44**
Retrofit with	NOx Master	NOx Master	NOx Master	NOx Master	NOx Master	NOx Master
Total Capital Cost	$100,000.00	$110,000.00	$100,000.00	$100,000.00	$110,000.00	$150,000.00
Incremental Project Cost	$100,000.00	$110,000.00	$100,000.00	$100,000.00	$110,000.00	$150,000.00
Capital Recovery Factor	0.1	0.1	0.1	0.1	0.1	0.1
Cost Effectiveness $/ton	**$9,570.01**	**$14,222.29**	**$13,664.38**	**$12,170.42**	**$20,717.96**	**$13,114.47**
Fuel Consumption - 100%	17.53 gal/hr	26.47 gal/hr				
Fuel Consumption - 75%	13.15 gal/hr	19.85 gal/hr			**Average $/Ton**	**$13,849**
Fuel Consumption - 50%	8.77 gal/hr	13.24 gal/hr				
Nox Emissions	23.1 g/bhp-hr	24.6 g/bhp-hr			**Yearly NOx Emissions Reduction**	
					Tons per Year	**112.37**
Fuel Consumption - 100%	14.19 gal/hr	17.34 gal/hr				
Fuel Consumption - 75%	10.64 gal/hr	13 gal/hr				
Fuel Consumption - 50%	7.09 gal/hr	8.67 gal/hr				
Nox Emissions	4.019 g/bhp-hr	4.019 g/bhp-hr				
Capitol Recovery Factor based on the barges being phased out in 2015 (14 years) = 0.1						
Emission data for the barges are based on testing done on one of each style engine and carried over to the rest.						

Using Mobile Emission Credits

- In most regions, Mobile Source credits can be used at stationary sources.
- In Texas, Mobile Discrete Emission Reduction Credits (MDERCs) can be used for stationary sources at a 1-1 ratio.
- In South Coast Mobile Credits are converted into Reclaim Credits.

Summary

- Currently the demand for Emission Credits exceeds the supply.
- By using SCR/SNCR technologies (NOxMaster), it is now economically feasible to create Mobile Source Emission Credits.
- By creating credits you mitigate risk by not being subject to price spikes in the market. (July 2000 NOx RTC credits traded at $124,000 a ton)
- Most projects will yield a high return on investment!!

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